a1

1. (Amended) Phosphorus-containing polymer, suitable for coating dielectric surfaces, of the general formula I or II,

$$P(A)_m(F)_{n1}(U)_{o1} \qquad (I)$$

$$P(A)_m(UF_{n2})_{o2} \qquad (II)$$

in which

P stands for a linear or branched, uncrosslinked or crosslinked, homo- or heteropolymeric polymer component,

A stands for identical or different phosphorus-containing groups bonded to P,

m stands for a number from 3 to 1000,

F stands for identical or different functional groups bonded directly or indirectly to P, which are present in addition to A,

n1 stands for a number from 1 to 1000,

n2 stands for a number from 1 to 100,

U stands for identical or different, linear or branched, uncrosslinked or crosslinked oligomeric or polymeric segments, made up of identical or different monomers, which are bonded to P,

o1 stands for a number from 0 to 1000,

o2 stands for a number from 1 to 1000.

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2. (Amended) Polymer according to Claim 1, wherein said polymer contains phosphorus-containing groups A in an amount of from 0.001 to 10 mEq.

3. (Amended) Polymer according to Claim 1, wherein said polymer contains functional groups F in an amount of from 0.001 to 20 mEq.

4. (Amended) Polymer according to Claim 1, wherein said polymer contains segments U in an amount of from 0.001 to 20 mEq.

5. (Amended) Polymer according to Claim 1, wherein the polymer has an average molar mass of from 1000 to 10,000,000 g/mol.

6. (Amended) Polymer according to Claim 1, wherein the polymer component P is a statistical copolymer or block copolymer.

7. (Amended) Polymer according to Claim 1, wherein the polymer component P is hydrophilic.

8. (Amended) Polymer according to Claim 1, wherein said polymer contains phosphorus-containing groups A in the form of a spacer carrying from one to six identical or different phosphorus-containing radicals.

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9. (Amended) Polymer according to Claim 1, wherein said polymer contains functional groups F that can form covalent bonds, coordination bonds or take part in biochemical recognition reactions.

10. (Amended) Polymer according to Claim 1, wherein said polymer contains functional groups F with crosslinkers.

11. (Amended) Polymer according to Claim 1, wherein the segments U have a molar mass, or average molar mass, of from 100 to 10,000.

12. (Amended) Polymer according to Claim 1, wherein the groups or segments U are hydrophilic.

13. (Amended) Process for preparing a polymer according to Claim 1, comprising the step of copolymerizing

(A) a monomer containing a phosphorus-containing group A, or a plurality of identical or different monomers containing identical or different phosphorus-containing groups A

with

(B) a monomer containing a functional group F, or a plurality of identical or different monomers containing identical or different functional groups F, and

(C) optionally, a monomer containing a segment U, or a plurality of identical or different monomers containing identical or different segments U,

to form a polymer of the formula I,

or with

(B′) a monomer containing a unit $(UF_{n2})_{o2}$ according to formula II, or a plurality of identical or different monomers containing identical or different units of the formula $(UF_{n2})_{o2}$ according to formula II,

to form a polymer of the formula II.

14. (Amended) Process for preparing a polymer according to Claim 1, comprising the following steps:

(i) preparing a polymer, which forms the polymer component P and carries identical or different functional groups that are suitable as functional groups F,

(ii) reacting some of the functional groups to form identical or different phosphorus-containing groups A, and

(iii) optionally, reacting some of the functional groups to form identical or different segments U,

wherein step (iii) can be carried out after, before or together with step (ii), and wherein not all the functional groups are converted in steps (ii) and (iii), and the functional groups that are not converted in steps (ii) and (iii) form the functional groups F of the polymer.

15. (Amended) Process according to Claim 14, wherein some or all of the functional groups that have not been converted in steps (ii) and (iii) are reacted with one or more identical or different crosslinkers to form functional groups F.

16. (Amended) A method of using a polymer according to Claim 1, comprising the step of applying the polymer to a dielectric material so as to form a coating on the dielectric material.

17. (Amended) The method of claim 16, wherein the dielectric material is a dielectric waveguide or a portion of a dielectric waveguide.

18. (Amended) An optical signal transducer having a coated dielectric waveguide, wherein the coating on the dielectric waveguide consists of a polymer according to claim 1.

19. (Amended) A method of using the optical signal transducer of claim 18, wherein said optical signal transducer is exposed to a fluid containing at least one chemical and/or biochemical recognition element which is then immobilized on the coating on the dielectric waveguide.

Please add new claims 20 - 33 as follows.

20. (New) Polymer according to Claim 1, wherein said polymer contains phosphorus-containing groups A in an amount of from 0.01 to 5 mEq.

21. (New) Polymer according to Claim 1, wherein said polymer contains phosphorus-containing groups A in an amount of from 0.1 to 3 mEq.

22. (New) Polymer according to Claim 1, wherein said polymer contains functional groups F in an amount of from 0.01 to 10 mEq.

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23. (New) Polymer according to Claim 1, wherein said polymer contains functional groups F in an amount of from 0.5 to 10 mEq.

24. (New) Polymer according to Claim 1, wherein said polymer contains segments U in an amount of from 0.01 to 10 mEq.

25. (New) Polymer according to Claim 1, wherein said polymer contains segments U in an amount of from 0.5 to 10 mEq.

26. (New) Polymer according to Claim 1, wherein the polymer has an average molar mass of from 2100 to 1,000,000 g/mol.

27. (New) Polymer according to Claim 1, wherein the polymer has an average molar mass of from 5000 to 500,000 g/mol.

28. (New) Polymer according to Claim 1, wherein the polymer has an average molar mass of from 5000 to 300,000 g/mol.

29. (New) Polymer according to Claim 1, wherein the polymer has an average molar mass of from 10,000 to 150,000 g/mol.

30. (New) Process for preparing a polymer according to Claim 1, comprising the following steps:

(i) preparing a polymer, which forms the polymer component P and carries identical or different functional groups that are suitable as functional groups F, said functional groups F being selected from the group consisting of hydroxyl groups, carboxyl groups, derivatives of carboxyl groups and amine groups,

(ii) reacting some of the functional groups to form identical or different phosphorus-containing groups A, and

(iii) optionally, reacting some of the functional groups to form identical or different segments U, wherein step (iii) can be carried out after, before or together with step (ii), and wherein not all the functional groups are converted in steps (ii) and (iii), and the functional groups that are not converted in steps (ii) and (iii) form the functional groups F of the polymer.

31. (New) The method of claim 16, wherein the dielectric material comprises at least one material selected from the group consisting of TiO_2, Ta_2O_5, ZrO_2, HfO_2 and Al_2O_3.

32. (New) The method of claim 16, wherein the dielectric material comprises at least one material selected from the group consisting of TiO_2 and Ta_2O_5.

33. (New) An optical signal transducer having a coated dielectric waveguide, wherein the coating on the dielectric waveguide consists of a polymer according to claim 1 and the dielectric waveguide comprises at least one material selected from the group consisting of TiO_2, Ta_2O_5, ZrO_2, HfO_2 and Al_2O_3.-